

## WHAT IS CLAIMED IS:

- 1                    1.        A process for the generation of low nanosized particles of one  
2 or more metals or the combusted products thereof, comprising:
  - 3                    a)        providing a multi-element diffusion flame burner having a  
4 plurality of combustible gas passageways and combusting gas  
5 passageways arranged in a geometric array defining a  
6 substantially planar burner surface, and optionally, one or a  
7 plurality of spaced apart precursor supply passageways;
  - 8                    b)        supplying non-premixed combusting gas to said combusting  
9 gas passageways and non-premixed combustible gas to said  
10 combustible gas passageways and igniting to form a primary  
11 flame;
  - 12                    c)        introducing a particle precursor into at least one of  
13 (i)        said combusting gas,  
14 (ii)       said combustible gas, or  
15 (iii)      said precursor supply passageways, and  
16 d)        recovering a nanosized combusted particle product.
  
- 1                    2.        The process of claim 1, wherein said precursor comprises at  
2 least one volatile metal compound of a metal of groups 3 to 7, a transition metal, or  
3 an inner transition metal.
  
- 1                    3.        The process of claim 1, wherein said precursor comprises a  
2 volatile metal alkyl, metal alkoxide, metal hydride, metal halide, metal salt of an  
3 organic carboxylic acid, metal glycolate, metal olefin complex, or a mixed metal  
4 compound containing at least one metal and two or more alkyl, alkoxide, hydride,  
5 halide, carboxylate, olefin, or glycolate moieties.
  
- 1                    4.        The process of claim 1, wherein said metal comprises silicon,  
2 titanium, aluminum, zirconium, gold, silver, platinum, or tin.

1                    5.        The process of claim 1, wherein said nanosized particles have  
2        a mean particle size of less than 50 nm.

1                    6.        The process of claim 1, wherein said precursor is an organic  
2        tin compound and said nanosized particle product comprises one or more of Sn(0),  
3        SnO, or SnO<sub>2</sub>.

1                    7.        The process of claim 6, wherein said nanosized particle  
2        product comprises Sn(0).

1                    8.        The process of claim 1, wherein at least one of said  
2        combusting gas or said combustible gas is diluted with an inert gas.

1                    9.        An Sn(0) or SnO nanosized particle product, prepared by the  
2        process of claim 1.

1                    10.      The process of claim 1, further comprising  
2                    d)        altering the flame stoichiometry to vary the oxidation state of  
3        said combusted product.